Claims

1. Use of substances that impair cellular peptide processing for MHC presentation, such as inhibitors of TAP (transporters associated with antigen processing) or of the proteasome, for preparation of a pharmaceutical agent or vaccine that can stop or prevent cancer growth or virus infection by stimulating immunological effectors, especially $CD8^+$ cells, preferably cytotoxic cells, directed against antigens or epitopes associated with impaired cellular peptide processing, especially MHC class I dependent.

2. Use of substances according to claim 1, **characterized** in that the substances inhibit the function and/or the expression of TAP such as TAP-inhibitors e.g. ICP47 of HSV type 1, IE 12 of HSV type 2 or a gene encoding a TAP inhibitor or a nucleotide sequence that is complementary at least in part to the RNA or DNA sequences encoding TAP e.g. antisense oligonucleotides or ribozyme destroying RNA.

3. Use of substances according to claim 1, **characterized** in that the substances inhibit the function and/or the expression of proteasome such as proteasome inhibitors e.g. a peptide aldehyde Z-Leu-Leu-H or Lactacystin, or a gene encoding a proteasome inhibitor or a nucleotide sequence that is complementary at least in part to the mRNA or DNA sequences encoding proteasome e.g. antisense oligonucleotides or ribozyme destroying RNA.

4. Use of antigens or epitopes associated with impaired cellular peptide processing, especially MHC class I dependent, e.g. peptides or parts of MHC class I molecules, to elicit specific T-cells, preferably $CD8^+$ T-cells, directed against antigens or epitopes associated with impaired cellular peptide processing, for preparation of a pharmaceutical composition.

5. Use of molecules including T-cell receptors or parts of T-cell receptors, directed against MHC class I dependent antigens or epitopes associated with impaired cellular peptide processing, for preparation of a pharmaceutical composition.

6. Cells, that express antigens or epitopes associated with impaired cellular peptide processing, especially MHC class I dependent, chosen from mammalian cells or non-mammalian cells, e.g. cells that lack TAP and/or proteasome function and to which human MHC class I molecules could be transfected, to be used for preparing a pharmaceutical or vaccine against cancer or virus infections, by stimulating immunological effectors, especially $CD8^+$ cells, preferably cytotoxic cells, directed against antigens or epitopes associated with impaired cellular peptide processing, especially MHC class I dependent.

7. Cells according to claim 6, **characterized** in that they are mammalian cells such as hematopoetic cells, e.g. dendritic cells, or other autologous cells, especially cells from the tissue of the origin of a cancer, or non-mammalian cells, such as insect cells.

8. Lymphoid cells such as T-cells e.g. CTL, preferably $CD8^+$ T lymphocytes activated against antigens or epitopes associated with impaired cellular peptide processing, especially MHC class I dependent, to be used for preparing a pharmaceutical or vaccine against cancer or virus infections.

9. A process for induction of antigens or epitopes associated with impaired cellular peptide processing, especially MHC class I dependent, in mammalian cells, **characterized** in that:

a) the cells are treated with agents that inhibit substances that take place in the cellular peptide processing in mammalian cells e.g. TAP-inhibiting or proteasome inhibiting agents, such as ICP 47, antisense nucleotides or ribozyme together with a pharmaceutically acceptable adjuvant, or

b) a sequence that codes for such an inhibiting agent is introduced into the DNA of the cell, or

c) a nucleotide sequence that is complementary at least in part to the mRNA or DNA sequences encoding a substance that takes place in the cellular peptide processing in mammalian cells e.g. TAP or proteasome is introduced into the DNA of the cell, such as antisense oligonucleotides or ribozyme destroying RNA, or

d) the cells are treated with an appropriate ribozyme, such as a ribozyme that combine enzymatic processes with the specificity of antisense base pairing, and

e) when non-mammalian cells are used, such as cells that lack TAP and/or proteasome function and to which human MHC class I molecules have been transfected, e.g. insect cells, transfection thereof with human MHC class I molecules and

f) the cells may be irradiated with an appropriate dose with e.g. γ-irradiation from e.g. Cs^{137}.

10. A kit, for use in a process for induction of antigens or epitopes associated with impaired cellular peptide processing, especially MHC class I dependent, in cells, **characterized** in that it comprises an active dose of a substance that induces antigens or epitopes associated with impaired cellular peptide processing, especially MHC class I dependent, such as an inhibitor of TAP or of proteasome or a nucleotide sequence that is complementary at least in part to the mRNA or DNA sequences encoding proteasome or TAP e.g. antisense nucleotides or ribozyme, possibly also comprising appropriate adjuvants, such as e.g. cytokines and genes for costimulatory molecules, such as B7, gold beads and liposomes.

11. A pharmaceutical composition or a vaccine comprising a pharmaceutically effective dose of a substance that induces antigens or epitopes associated with impaired cellular peptide processing, especially MHC class I dependent, such as an inhibitor of TAP or of proteasome or a gene encoding a proteasome or a TAP inhibitor or a nucleotide sequence that is complementary at least in part to the mRNA or DNA sequences encoding proteasome or TAP e.g. antisense nucleotides or ribozyme to-

gether with a pharmaceutically acceptable adjuvant, e.g. cytokines and costimulatory molecules.

12. A process for treatment, prevention and diagnosis of cancer and virus infections, **characterized** in that:

a) cells taken out of the body of a human being are treated with inhibitors of cellular peptide processing, e.g. TAP-inhibitors, and are readministered to the body possibly together with a pharmaceutically acceptable adjuvant, or

b) cells that express antigens or epitopes associated with impaired cellular peptide processing, especially MHC class I dependent, are administered to the body possibly together with a pharmaceutically acceptable adjuvant, or

c) autologous T-cells are stimulated in vitro against antigens or epitopes associated with impaired cellular peptide processing, especially MHC class I dependent, and are administered to the body, or

d) inhibitors of cellular peptide processing for MHC class I presentation are administered to the body, such as TAP-inhibitors, together with a pharmaceutically acceptable adjuvant, or

e) antigens or epitopes associated with impaired cellular peptide processing, especially MHC class I dependent, are administered to the body, e.g. a peptide or MHC class I complexes or a part thereof, or

f) a T-cell receptor or a part thereof directed against antigens or epitopes associated with impaired cellular peptide processing, especially MHC class I dependent, is administered to the body.

add a'